to increase the production rate of optical disks by the method and system disclosed herein.

This document claims priority and contains subject matter related to Japanese Patent Application No. 10-367529, filed with the Japanese Patent Office on Dec. 24, 1998, the entire contents of which are hereby incorporated by reference.

Additional modifications to, and variations of, the embodiments described above may be made without departing from the spirit and the scope of the embodiments disclosed herein as defined in the appended claims.

What is claimed is:

1. A method of initializing a phase-change optical information recording medium, comprising the steps of:

providing a semiconductor laser device;

providing an optical system including said semiconductor laser device configured to be utilized for initializing said phase-change optical information recording medium; and

irradiating at least a part of said phase-change optical information recording medium by means of light beams emitted from said semiconductor laser device;

wherein,

in the spatial distribution of the semiconductor laser power focused on said recording medium in the direction perpendicular to guide tracks, said semiconductor laser device has an average in a first end region with a first predetermined width, and a second end region with a second predetermined width, of the width at half maximum of the spatial distribution, smaller than an average in the center region of the full width at half maximum of the spatial distribution.

2. The method of initializing a phase-change optical information recording medium according to claim 1, wherein

said first predetermined width is at 0% to 10% of the width at half maximum of the spatial distribution and said second predetermined width is at 90% to 100% of the width at half maximum of the spatial distribution.

3. The method of initializing a phase-change optical information recording medium according to claim 1, wherein

said step of providing said semiconductor laser device includes polishing edge surfaces of at least one of an active layer and a reflective layer of said semiconductor laser device, substantially perpendicular to the direction of the laser emission, such that an average of the laser power in at least one of the end regions of the laser power distribution at 0% to 10% and 90% to 100% of the width at half maximum of the spatial distribution is smaller than an average of laser power in the center region of the full width at half maximum of the spatial distribution.

4. The method of initializing a phase-change optical information recording medium according to claim 1, further comprising the step of:

providing at least one optical device in said optical system, configured to attenuate the light beams emitted from said semiconductor laser device such that an average of the laser power in at least one of the end regions of the laser power distribution at 0% to 10% and 90% to 100% of the width at half maximum of the spatial distribution is smaller than an average of laser power in the center region of the full width at half maximum of the spatial distribution.

5. The method of initializing a phase-change optical information recording medium according to claim 4, wherein

said optical device is an optical filter.

6. The method of initializing a phase-change optical information recording medium according to claim 1, wherein

said semiconductor laser device is cured by energizing for at least about six hours with at least about 80% of a maximum allowable electric power prior to said initializing said recording medium such that an average of the laser power in at least one of the end regions of the laser power distribution at 0% to 10% and 90% to 100% of the width at half maximum of the spatial distribution is obtained to be smaller than an average of laser power in the center region of the full width at half maximum of the spatial distribution.

7. The method of initializing a phase-change optical information recording medium according to claim 1, wherein

a distance of the laser device displacement perpendicular to the guide tracks per disk rotation is larger than one half of; and smaller than, the width at half maximum of the spatial laser power distribution of said light beams on said recording medium.

8. The method of initializing a phase-change optical information recording medium according to claim 7, wherein

said semiconductor laser device has laser emissions having a width at half maximum of at least 80 microns of the spatial power distribution on said recording medium in the direction perpendicular to guide tracks.

9. A method of initializing a phase-change optical information recording medium comprising the steps of:

directing an energy beam at a phase-change optical information recording medium;

causing relative motion between the beam and the medium;

said relative motion causing the beam to irradiate successive bands of the medium that partly overlap; and

said beam having a power distribution and said overlap being to a degree causing the irradiated areas of the medium to receive substantially the same cumulative energy from the beam despite said overlap.

10. A method as in claim 9 in which said energy beam is a laser beam generated at a laser device.

11. A method as in claim 10 including the step of polishing the laser device to achieve a laser beam power distribution configured to achieve said substantially same cumulative amount of energy despite said overlap.

12. A method as in claim 10 including the step of filtering the laser beam prior to its reaching the medium to achieve a laser beam power distribution configured to achieve said substantially same cumulative amount of energy despite said overlap.

13. A method as in claim 10 including the step of curing the laser device prior to initializing the medium to alter the power distribution of the laser beam to a distribution achieving said substantially same cumulative amount of energy despite said overlap.

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